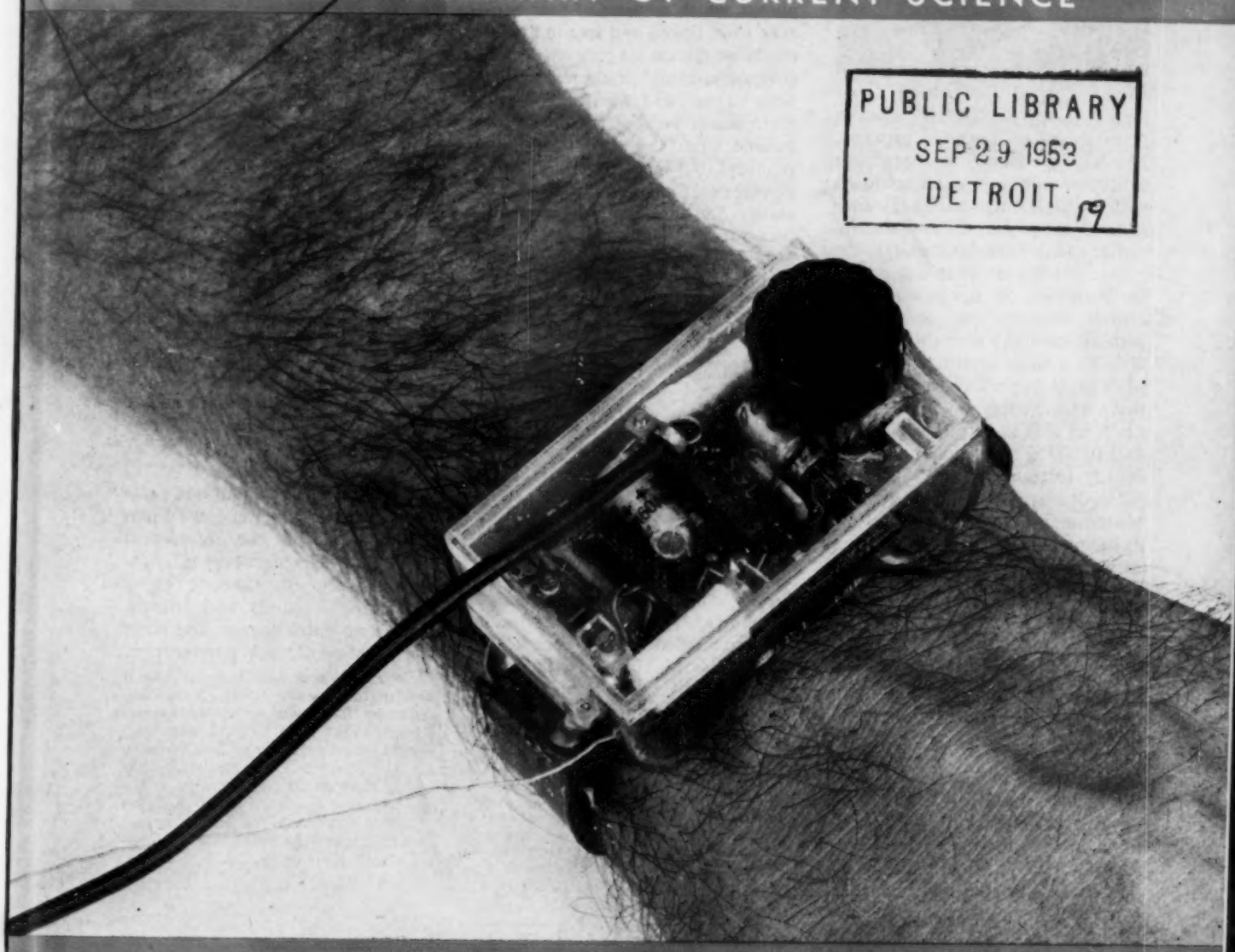
15¢
$5.50 A YEAR
September 26, 1953
VOL. 64, NO. 13 PAGES 193-208

SCIENCE NEWS LETTER

®

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Transistor Radio

See Page 196

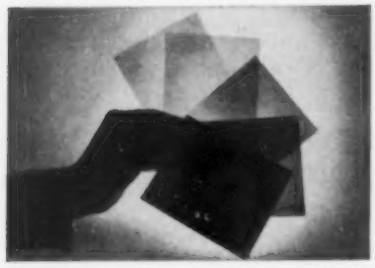
A SCIENCE SERVICE PUBLICATION

Kodak reports to laboratories on:

precisely pre-exposed film... why and how we produced a better phosphor for scintillation counters... a laboratory instrument you can have fun with

Flashed densities

Generally we sell our film unexposed, but even to that there is an exception. We refer to *Kodak Flashed*



Densities, used for cutting down light by a specific fraction. They're plain sheets of precisely exposed, precisely processed, and precisely calibrated film (not to be confused with *Kodak Wratten Neutral Density Filters*, in which diffuse density nearly equals specular density).

One application is in equipment for patrolling the smoke output of distant chimneys by comparison with adjacent sky seen through the film. To a wider audience than just smokestack inspectors, we announce that we can supply any flashed density from .05 (89% transmission) to 4.05 (0.009% transmission), with a density tolerance of ± 3% or ± .02 in density, whichever is greater. Maximum usable area is 7½″ x 9½″, including holes at the corners. Prices vary from $2.75 for 4″ x 5″ size in the .05 to 1.05 density range, up to $25.25 for 8″ x 10″ in the 3.06 to 4.05 density range.

If any questions about Kodak Flashed Densities *occur to you, drop a note to Eastman Kodak Company, Industrial Photographic Sales Division, Rochester 4, N. Y.*

To scintillate

We've been receiving letters from physicists lately asking for suggestions on new and better phosphors for scintillation counters, substances that emit a light flash when excited by an ionizing nuclear particle. Certainly no mass market there, but we thought we'd look around to see if we couldn't find a really highly conjugated molecule for the boys, meaning alternating single and double bonds between the carbon atoms.

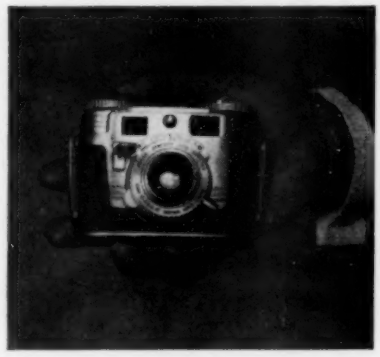
There's a fellow who teaches chemistry at a college an hour's drive away and drops in occasionally hunting for worthy projects to throw at his students. We asked him what he could do with *p-Quaterphenyl*, which consists of four benzene rings linked end to end and is therefore about as conjugated a compound as one could reasonably hope to prepare for now. We knew there was some of it present in the residue from the manufacture of biphenyl, but in that coal-like conglomerate it was bound to prove elusive. After talking it through, two routes to purified *p-Quaterphenyl* emerged. We selected one, and two young men then embarked

on an instructive experience that began with an Ullmann reaction of iodobiphenyl with copper powder and concluded as 600 grams in a stock bottle labeled "Eastman 6866." With scintillation so warm a topic as competition to the Geiger counter in physics laboratories, we expect the initial batch will not dwell long on our shelves, but we wouldn't want to bet one way or the other.

You can get a catalog of the more than 3500 Eastman Organic Chemicals by writing Distillation Products Industries, Eastman Organic Chemicals Department, Rochester 3, N. Y. (Division of Eastman Kodak Company).

The Signet

We *are* betting—heavily—on the *Kodak Signet 35 Camera* and the job it can do wherever picture taking is required in the world of scientific investigation. The day is some time past when a fine hand



camera like the *Signet* could be placed in the economic classification of luxury goods. From the geologist who captures an interesting stratified formation on film to the physical chemist recording a laboratory test setup soon to be torn down, a camera that makes pictures with a minimum of fuss and a maximum of quality is no luxury—it's a necessity.

But, since neither man nor camera can work all the time, we'd like to point out that the *Signet* also makes an all-remembering companion when it's time to enjoy yourself with family and friends. There's no extra charge, and what you spend on film you'll never miss.

Drop in at your Kodak dealer's for a look at the Signet. *Takes 35mm film, color or black-and-white, of course.* Kodak Ektar *f*/3.5 Lens, Lumenized, *finest kind of lens we know how to make. Kodak Synchro 300 Shutter. Lens mount rides on 50 ball bearings as the focusing ring is turned under direction of the superimposed-image-type rangefinder. Exquisitely integrated mechanical design. Lists at $92.50.*

Prices include Federal Tax where applicable and are subject to change without notice.

This is one of a series of reports on the many products and services with which the Eastman Kodak Company and its divisions are... *serving laboratories everywhere*

Kodak

SURGERY

Cut Bleeding Deaths

Eight-point guide to discovery of prevention methods takes into account conditions associated with intestinal bleeding and relation to ulcer production.

▶ AN EIGHT-POINT guide to discovery of ways to cut deaths due to bleeding from stomach and intestinal tract was reported by Dr. Karl A. Meyer of Northwestern University Medical School, Chicago, at the meeting in New York of the U. S. and Canadian Chapters of the International College of Surgeons.

The eight-point guide consists of eight kinds of disease or damage found more often in patients with bleeding from the stomach and intestinal tract than would be expected. These are: coronary sclerosis in which the heart's arteries are hardened; heart disease with high blood pressure; damage to the big artery called the aorta resulting from syphilis; rheumatic heart disease; hardening of the kidneys and their arteries; liver damage; pancreas damage; and goiter.

Dr. Meyer and his associates feel that the possible relationship of these conditions with the known mechanisms of ulcer production point the way to studies which should help cut the present over-all ulcer hemorrhage mortality of 10% to "a safer level."

A study of about 1,200 ulcer patients treated at the Cook County Hospital over a three-year period showed that hemorrhages were experienced by about one-third, he reported. Hemorrhages accounted for 36 of the 66 deaths in this series. Of 205 definitive stomach operations performed, massive bleeding was the chief reason in 105 cases.

Dr. Meyer reported that autopsies of patients dying of massive gastrointestinal hemorrhage showed that gastric and duodenal ulcers accounted for about one-half of the cases. Esophageal varices (enlarged veins in the esophagus), resulting from cirrhosis of the liver, were responsible for about 30% of fatal cases of bleeding. Various lesions accounted for the others.

"It was further learned that a fatal outcome of gastrointestinal hemorrhage was not limited to any decade of life, though there appears to be a trend wherein the vast majority of cases occurred between the fourth and the eighth decades," Dr. Meyer said. "A four-to-one preponderance of bleeding in the male sex and the white race suggested a possible endocrine aspect to this problem.

"Because of the striking frequency with which bleeding occurred between the fourth and eighth decades, almost irrespective of the etiological factor, the investigation of the associated pathology in these patients was undertaken in the hope that some clue might be unearthed that might answer the problem of what causes the fatal outcome."

Science News Letter, September 26, 1953

LARGEST HELICOPTER—This giant, believed to be the world's largest helicopter, will carry 40 passengers and a normal crew of three in the service of the U. S. Air Force. It is powered by two rotors mounted one behind the other, the blades of which are 82 feet in diameter.

MEDICINE

Scale Rates Jobs By Energy Cost

▶ A SCALE for rating jobs for patients who have had heart attacks has been devised by Drs. Joseph G. Benton and Howard A. Rusk of New York University College of Medicine.

The scale rates jobs in terms of energy cost. This is determined by measuring how much oxygen per unit of body weight is consumed in the course of each job or activity in comparison to the amount consumed while at rest.

The energy cost of making a bench out of pine board, which entailed such tasks as sawing, filing, sanding, boring holes with a hand drill and using a screw driver ranged from 1.2 to 2.5 times the resting rate. This energy cost was the same for heart patients and for normal, healthy persons.

Very few working situations, apart from heavy labor, take a sustained energy output of more than two to four times the resting rate. Work only becomes strenuous when its energy cost increases to eight, the doctors reports.

Moderate work has an energy cost of three.

In most jobs, persons in normal health rarely call on their full energy potential. Thus there remains a substantial margin which acts as a safe reserve for most heart patients in most jobs.

Except for extremely heavy labor, almost all the physical activities required in performing a job appear to be within the capacity of most people with heart disease, the tests with heart patients at the New York University-Bellevue Medical Center in New York showed. The results of these tests are reported in *Circulation* (Sept.), the monthly scientific journal of the American Heart Association.

Science News Letter, September 26, 1953

PHYSICS

"Cosmic Stopwatch" Splits Seconds Fine

▶ A "COSMIC STOPWATCH" splits time into billionths of seconds.

Under the direction of Dr. Harold Ticho, a group of physicists at the University of California at Los Angeles designed the instrument for cosmic ray studies under an Army Ordnance grant.

The device will be used to measure the

lifetimes of heavy mesons, particles from atomic nuclei. Such particles are thought to exist for only billionths of a second. (One-billionth of a second is to a second as one second is to a hundred years).

The works of the outsized watch include Geiger tubes, scintillation counters, vacuum tubes and certain germanium elements. It works like this:

Fast moving cosmic rays from outer space, which bombard the earth constantly, create these mesons when they collide with atoms of matter in the device. These mesons pass through a fluorescent fluid in the instrument, then cease to exist. Their passage through the fluid causes a brief and feeble flash of light which is picked up by a photomultiplier tube causing it to flash briefly. The time interval between the two flashes is recorded and represents the mesons' brief life span.

Geiger tubes, which detect arrival of cosmic rays, alert the timing mechanism when to start ticking off its billionths of a second. The face of the stopwatch is actually the face of an oscilloscope and is characterized by a series of waves. Wave crests correspond to the numbers on a clock and are two-billionths of a second apart.

Science News Letter, September 26, 1953

METEOROLOGY

Weather Now Computed

Much more accurate forecasts in future promise of new techniques of making models of world's weather in "dish-pan" or figuring it out on electronic "brain."

➤ MODELS OF the world's weather, made either in whirling bowls or computed mathematically by giant electronic "brains," promise much more accurate weather forecasts within the next few years.

Better understanding of the causes and effects of our weather using these two types of models were foreseen by top weather experts from the United States, England, Canada and other countries attending the international Toronto Meteorological Conference.

The big question still baffling weathermen is whether our weather starts at the top of the atmosphere and works down, or begins near the earth's surface, with effects observed later at high altitudes.

By swirling colored water in dishpans and bowls, the large-scale patterns of atmospheric flow are easily seen. These patterns can be changed by varying the rate of heating, by introducing obstacles to represent mountains and other geographic features, and by using both cold and heat sources. Thus meteorologists such as Dr. Dave Fultz of the University of Chicago and Dr. Robert R. Long of Johns Hopkins University are duplicating on a small scale some of the vast changes known to be occurring in the world's weather as the seasons change, or as air masses flow past mountain ranges.

Dr. Sverre Petterssen of the University of Chicago pointed out, for instance, that about 1,000 gigantic storm centers are generated every year, and about one-half of these occur in "well-defined patterns near mountain ranges."

Yet at least two severe storms have been forecast with an electronic computer using information from weather maps drawn 12 hours before the storm began. This was done by Dr. Jule Charney of the Institute for Advanced Study. Weather changes have also been followed using mathematically simplified models of the atmosphere by Drs. R. C. Sutcliffe and J. S. Sawyer of the Meteorological Office, Dunstable, Beds., England, and Dr. E. T. Eady of the Imperial College of Science and Technology, London.

In such models, the effect of heat or geography is not directly taken into account, yet many top experts, such as Dr. J. Bjerknes of the University of California, believe that the heating effects can not be ignored.

Within a few years, however, experiments now being conducted with dishpan and mathematical models of atmospheric circulation are expected by meteorologists to give answers to these problems, and thus better weather forecasts.

Science News Letter, September 26, 1953

RADIO

Signal Corps Wrist Radio Picks Up N. Y. Stations

See Front Cover

➤ A WRIST radio has been developed at the Signal Corps Engineering Laboratories at Fort Monmouth, N. J., that uses three transistors instead of ordinary vacuum tubes and picks up New York City radio broadcasts 40 miles away.

Powered by a mercury battery a little larger than the tip of a pencil, the radio has a short antenna worn up the user's sleeve comic-strip style. Sound is carried to the soldier's ear through wires that connect to a hearing-aid earpiece.

Although the tiny radio does not transmit, it can receive programs on a tuning range of 1,000 to 1,500 kilocycles. This is about half of the standard broadcast band.

Built to explore the possibilities of shrinking bulky Signal Corps equipment, the radio is housed in a transparent plastic case two inches long, one and one-eighth inches wide and three-fourths of an inch thick. It is shown on the front cover of this week's SCIENCE NEWS LETTER. The complex wiring of standard radios is replaced by printed circuits etched in its chassis.

Signal Corps officials credit the transistor with making the tiny radio possible. Transistors are pea-sized chunks of a rare metal germanium. They can do some of the radio amplifying jobs done by much larger vacuum tubes such as are in television and radio sets. They require little power.

Science News Letter, September 26, 1953

SCIENCE NEWS LETTER

VOL. 64 SEPTEMBER 26, 1953 NO. 13

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. W., Washington 6, D. C., NOrth 7-2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., $5.50; 2 yrs., $10.00; 3 yrs., $14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C., under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 34.40, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 1 E. 54th St., New York 22, ELdorado 5-5666, and 360 N. Michigan Ave., Chicago 11, STate 2-4822.

SCIENCE SERVICE

The Institution for the Popularization of Science organized 1921 as a non-profit corporation.

Board of Trustees—Nominated by the American Association for the Advancement of Science: Fernandus Payne, National Science Foundation; Karl Lark-Horovitz, Purdue University; Kirtley F. Mather, Harvard University. Nominated by the National Academy of Sciences: Harlow Shapley, Harvard College Observatory; R. A. Millikan, California Institute of Technology; Homer W. Smith, New York University. Nominated by the National Research Council: Leonard Carmichael, Smithsonian Institution; Ross G. Harrison, Yale University; Duane Roller, Hughes Aircraft Co. Nominated by the Journalistic Profession: A. H. Kirchhofer, Buffalo Evening News; Neil H. Swanson, Baltimore Sun Papers; O. W. Riegel, Lee Memorial Journalism Foundation. Nominated by the E. W. Scripps Estate: John T. O'Rourke, Washington Daily News; Charles E. Scripps, E. W. Scripps Trust; Edward J. Meeman, Memphis Press-Scimitar.

Officers—President: Harlow Shapley; Vice President and Chairman of Executive Committee: Leonard Carmichael; Treasurer: O. W. Riegel; Secretary: Watson Davis.

Staff—Director: Watson Davis. Writers: Jane Stafford, Marjorie Van de Water, Ann Ewing, Allen Long. Science Clubs of America: Joseph H. Kraus, Margaret E. Patterson. Photography: Fremont Davis. Sales and Advertising: Hallie Jenkins. Production: Priscilla Howe. Interlingua Division in New York: Alexander Gode, Hugh E. Blair, 80 E. 11th St., GRamercy 3-5410.

SURGERY

Danger from Plastics

Study on rats shows that use of plastic sheeting in their bodies produces cancer two years later in 45% of cases. Delay would be 15 years in humans.

➤ FRESH WARNING that imbedding plastics in the body may lead to cancer years later appears in studies by Dr. B. S. Oppenheimer, Mrs. Enid T. Oppenheimer and Drs. Arthur Purdy Stout and I. Danishefsky of the Institute of Cancer Research at Columbia University College of Physicians and Surgeons in New York.

So far, they state, no proven instance has been reported of cancer developing in humans after the use of plastics in surgery. But they have had as high as 45.4% of rats develop cancer after plastics were imbedded in their bodies.

In the rats and mice it took from one to two years for the cancers to appear. But if it takes this long for a cancer to appear in a rodent, it may take 10 to 15 years for a similar result in a human being.

The Columbia scientists first warned of this possible cancer danger several years ago, as reported by SCIENCE SERVICE in 1949. They had been wrapping one kidney of rats with cellophane to produce high blood pressure for studies of that condition. When they examined the bodies of these rats about two years later, they found cancers around the wrapped kidneys of seven of them.

At that time, surgeons were beginning to use cellophane and polyethylene plastic films experimentally to replace the membrane covering the brain, for tendon transplantations, to connect cut nerves and in operations on arteries and plastic operations on joints. Since then these and newer plastic materials have been used increasingly on humans.

The Columbia scientists report in the journal *Science* (Sept. 11) that in their experiments with plastics imbedded in the bodies of rats and mice, cancers have been produced adjacent to or actually surrounding films of the following plastics: commercial cellophane film (regenerated cellulose), the same cellophane after intensive extraction by methyl alcohol, the same cellophane treated first with alcohol and then with benzene, two polyethylene films, including a pure one prepared especially for their experiments, polyvinyl chloride film, silastic, a silicone product, Teflon film, Dacron film, polystyrene film, and nylon film.

Science News Letter, September 26, 1953

BIOLOGY

Virus Broken in Pieces Loses Infectivity

➤ TOBACCO MOSAIC virus broken into sub-units no longer infects, Paul Kaesberg, M. A. Stahmann and R. V. Rice of the University of Wisconsin reported to the American Institute of Biological Sciences at Madison, Wis.

They sprayed water solutions of the virus onto collodion-covered electron microscope mounts which were held at the temperature of liquid air or 313 degrees below zero Fahrenheit. Then removing the water while the mounts were cold and under a high vacuum, they found that some of the particles were broken into an average of eight sub-units.

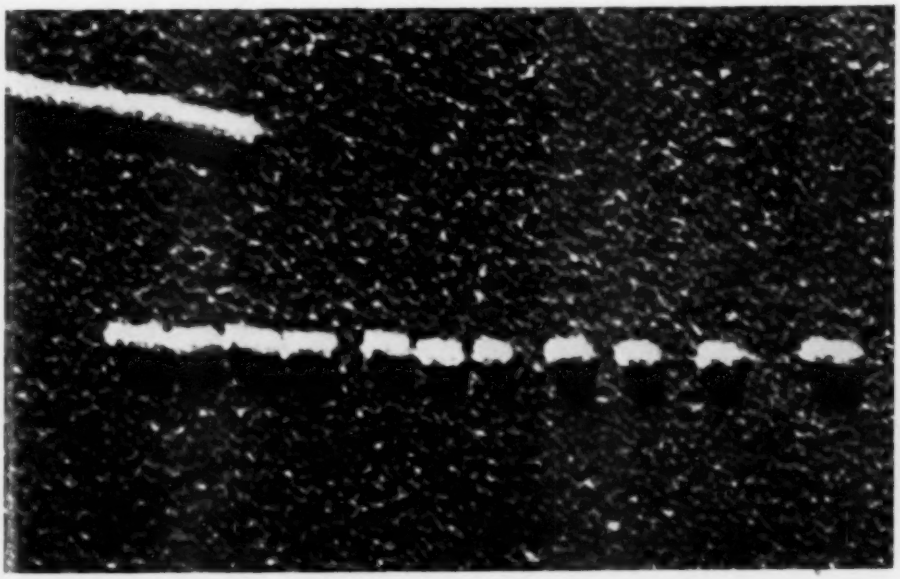
Almost all viruses are so small that they are not visible under ordinary microscopes, but by using the electron microscope viruses can be studied and photographed. Tobacco mosaic virus has been found to be about 12 one-hundred-thousandths of an inch long.

Solutions of the broken virus showed no increase in infectivity when tested on tobacco plants as compared to solutions of the unbroken virus. This indicates that only the intact particle causes the disease.

The three Wisconsin scientists also reported that the nucleic acid part of the virus seems to be released from the virus particle by the treatment. They postulated that the nucleic acid may have been in the center of the rod-shaped particle with the protein part forming a protective sheath. When the particles are broken with this new method, the nucleic acid may escape.

It is important to learn where the nucleic acids are located in the virus particle for they seem to constitute the part that enters the cell and causes the wild destructive growth characteristic of virus diseases. Nucleic acids are a fundamenal part of all cells. All viruses have nucleic acids, but only recently have scientists been able to discover something about their position in the virus particle.

Science News Letter, September 26, 1953



NOT DANGEROUS—A virus which has been broken up like this one has lost its power to infect. This is a broken tobacco virus, not visible under an ordinary microscope, as photographed under the electron microscope.

PSYCHOLOGY

Seniority Rules in Dairy Herd Society

➤ SENIORITY RULES the dairy herd. The social order among cows is that the animal that has been there longest is most feared and respected.

From watching a herd of 163 cows and heifers, M. W. Schein of the Louisiana Agriculture Experiment Station reported to the American Institute of Biological Sciences meeting in Madison, Wis., that in the bovine caste system the top cow is the senior animal in the herd.

Even when two older and heavier cows were put in pasture with 14 of the test herd, the strange cows did not take over the top rank, indicating that seniority, not age and weight, determines top cow.

Chickens have rank in their society based on what bird dares to peck what birds. A. M. Guhl of the Kansas City College experiment station reported these social rules are set when the chicks are nine weeks old. One hen in a flock pecks all others and at the bottom of poultry society is a hen pecked by all others.

Science News Letter, September 26, 1953

ZOOLOGY

To Study Camels

➤ WHAT DO camels have that we don't? To answer this question, four scientists will move into the Sahara desert this fall and turn nomad.

In a forbidding region of sand and rock where the temperature zooms as high as 140 degrees and where years may pass without rainfall, the scientists will spend 12 months finding out how camels manage to thrive in such hostile surroundings.

The water shortage and heat stress of the desert are deadly to most animals, including man. The camel's ability to withstand these hardships has long been a puzzle to zoologists.

So, equipped with a laboratory on wheels and special paraphernalia to give the animals as thorough a medical examination as any human being would ever want, Drs. Knut and Bodil Schmidt-Nielsen of Duke University, who will head the expedition, Dr. T. Richard Houpt of the University of Pennsylvania, and Dr. S. A. Jarnum of the University of Copenhagen, Denmark, will look for the answers to some old questions.

Some of these are: How great a water loss from its blood and tissues can the camel stand? Does the camel have any unknown way of storing water? How much does sweating help a camel keep cool?

In order to study the camel in its native surroundings and under its normal working conditions, the researchers will stay close to the tiny village of Beni Abbes, some 500 miles from Algiers.

Dr. Schmidt-Nielsen believes that more knowledge of the desert animals may lead to a better understanding of human beings' physical reactions to hot climates. Also an incentive to research is the fact that the camel is of great economic importance in technologically underdeveloped arid zones of the Old World.

Science News Letter, September 26, 1953

AERONAUTICS

Supersonic Freon Gales

➤ FUTURE WIND tunnels may unleash supersonic gales of Freon-12 upon airplane models to prove the worth of their aerodynamic designs.

The National Advisory Committee for Aeronautics reports that the colorless gas, often used as a refrigerant in air-conditioning systems, offers distinct advantages over air as "wind" in test tunnels.

Great power savings are made possible by the gas, since sound travels through Freon-12 about half as fast as it moves through air. This means the Freon-12 must be blown through the test section only about half as fast as air to produce supersonic conditions for the model.

Since the power required to operate a wind tunnel varies directly as the cube of the wind speed, it becomes highly desirable to pull the supersonic air stream down into a more economical, lower range of wind velocities.

Albert E. von Doenhoff, Albert L. Braslow and Milton A. Schwartzberg, all NACA scientists, reported that the NACA's low-turbulence pressure tunnel at Langley Field, Va., has been modified to use Freon-12 instead of air. As a result, the maximum test-section wind velocities were raised from Mach 0.4, which is four-tenths the speed of sound, to Mach 1.2.

The increase converted the tunnel from a subsonic research tool into modern supersonic facilities. The synthetic increase of air speeds furthermore required no additional power, or any change in the propeller.

However, since the gas is more easily compressed than air, allowances must be made for this. The three scientists now report they have worked out ways of predicting the model's behavior in air once it has been studied in the Freon-12 wind tunnel.

The NACA scientists' findings may have a significant impact upon the aviation industry. Building supersonic wind tunnels is costly and time-consuming. They are expensive to operate. With modifications, however, many existing subsonic wind tunnels may be converted virtually "over night" into supersonic facilities.

Science News Letter, September 26, 1953

PSYCHOLOGY

Report "Spanks" Youths For Auto Accident Record

➤ INCAUTIOUS, YOUTHFUL male auto drivers were given a verbal spanking for their traffic and accident records in a report prepared at Iowa State College, Ames, Iowa, by the Driving Research Laboratory.

A. R. Lauer and Donald A. Hoppe, both of the laboratory, have just completed a six-month 'round-the-clock study of highway users. Their data show "a block of wild drivers constituting about 10% of the 20-to-24-year-old group who flagrantly and dangerously violate the rules of driving safely from midnight to 4 a.m."

Drawing tentative conclusions from the study, Mr. Lauer states:

"Youthful male drivers are traveling too fast at late hours of the night for their experience and conditions of illumination. With all the basic physical qualifications for superior driving performance, their record of accidents is entirely unwarranted. Their record does not noticeably improve until a period of five to seven years has elapsed after being licensed."

Part of a projected five-year research program, the study also has revealed that older cars are driven faster on the whole than are new cars.

"This suggests a group of less responsible drivers are found on the highways at night," Mr. Lauer states. "The reverse is true for urban traffic."

The figures also show that speed and driver-age are inversely related in light traffic and that heavy traffic "cramps the style of speed demons." A 24-hour average shows that women drivers constitute about 14% of the total highway users.

Science News Letter, September 26, 1953

PHARMACY

No Sore Tongue From Penicillin O

➤ PENICILLIN O sounds like the refrain from a song, and it might well be sung gaily by patients who have gotten sore mouths and tongues from lozenges or troches of penicillin G. Because penicillin O does not cause this kind of irritation, researchers who are sensitive to penicillin G found from tongue tests on themselves of penicillin O.

This pencillin also produces fewer other allergic reactions than penicillin G with just about the same germ-killing ability, Dr. Bruce W. Churchill reported at the American Institute of Biological Sciences in Madison, Wis.

Dr. Churchill and Drs. J. H. Ford and D. R. Colingsworth of the Upjohn Company, Kalamazoo, Mich., developed penicillin O. Chemically, it is allylmercaptomethyl penicillin. Upjohn has tradenamed it Cer-O-Cillin and it has had extensive clinical tests during the past five years.

Science News Letter, September 26, 1953

SURGERY

Stump Muscles Move Artificial Hands

➤ KOREAN WAR veterans who lost hands in service are being fitted with artificial hands that can be moved by the muscles of the man's stump.

Civilians who lose hands in industrial or traffic accidents can have the same kind of hand, Dr. Ernst W. Bergmann of New York pointed out at the meeting in New York of the U. S. and Canadian Chapters of the International College of Surgeons.

The method can also be used for short arm stumps, he said.

Science News Letter, September 26, 1953

The bodies of *cattle* contain more than 26 different mineral elements.

MEDICINE

Ruptured Appendix Relief

ACTH and cortisone, famous for relief they give to arthritis patients, now found to help severe peritonitis. Surgery should not be delayed after treatment.

➤ THE HORMONES famous for relief they bring in arthritis, ACTH and cortisone, are helping some patients with severe and widespread peritonitis, Dr. Laurance W. Kinsell of Highland-Alameda County Hospital, Oakland, Calif., reported at the meeting in New York of the U. S. and Canadian Chapters of the International College of Surgeons.

The peritonitis patients suffered this life-threatening condition after ruptures of an appendix, stomach ulcers, gallbladders and other organs. (Peritonitis is an inflammation of the peritoneum, membrane lining the walls of the abdomen.)

Use of the hormones is based, Dr. Kinsell said, on the known ability of them to check inflammatory processes in general and on their non-specific antitoxic effect in a variety of severe toxemias, or poisonings.

"If the decision is made to administer the hormones to a patient prior to surgery, it is mandatory that surgery be performed as soon as the patient's condition has improved sufficiently," he warned. "Otherwise, one may be deceived by the apparent well being of the patient as the result of hormonal therapy, and postpone definitive treatment until the optimal time for operation has passed.

"In the case of generalized peritonitis particularly, it seems probable that hormonal therapy, if properly used, can minimize mortality and morbidity, and will permit of relatively early surgery in instances where such treatment otherwise would be postponed for a prolonged period.

"Hormonal therapy should rarely be continued for more than four days after surgery. As in the case of patients receiving ACTH and cortisone, suitable dietary and other measures must be used. These include: 1. adequate intake of protein and calories; 2. restriction of sodium; 3. addition of large amounts of potassium; 4. continuation of antibiotics for at least three days after hormone therapy has been discontinued."

Science News Letter, September 26, 1953

INVENTION

Tank-Like Shoe Permits Walking on Water

➤ SOME DAY an enemy may stare in saucer-eyed astonishment as U. S. Army Engineers walk around on water while building bridges for trucks to use.

The soldiers will not be endowed with a mysterious supernatural power. Instead they may be wearing the "water shoe" patented by Ludwig A. Geiger of New York City.

A single water shoe is designed to support the weight of the wearer so the soldier does not sink while he is taking a step forward.

According to the inventor, the shoes can be made in many designs. One style resembles a deep rectangular dish that has inflatable walls. Air is trapped inside the inverted dish as each step is taken. This air, along with the air in the inflated walls, buoys the soldier.

A modified version of this style features a paddlewheel that twirls each time a step is taken. A different style resembles an over-sized shoe, its high top fitting snugly around the calf of the soldier's leg to seal out water.

Inventor Geiger assigned his patent, No. 2,651,790, to Gerald L. Geiger of Washington, D. C.

Science News Letter, September 26, 1953

BIOLOGY

Test Crater Lake Water For Clues to Green Color

➤ WHY THE water is colored "apple green" in the recently discovered round crater lake in northern Labrador is being investigated by scientists at the Royal Ontario Museum in Toronto.

Dr. Victor Ben Meen, director of the Museum, explained that there are at least three reasons for the peculiar green color and turbid appearance in an area where the surrounding lakes are deep blue and clear. Algae, tiny, one-celled plants; melting of glaciers carrying ground-up rocks; and the metallic element, nickel, dissolved in the water could cause the "apple green" color.

The round lake, 185 yards across, is believed to have been carved out of the northern wilderness by the crash of a mammoth meteorite 3,000 to 15,000 years ago. It is a possible "baby brother" to the giant Chubb crater in northern Quebec, which has a diameter of over two miles.

The peculiar round lake was first spotted on a photograph taken by Col. Arthur F. Merewether of the U. S. Air Force. Dr. Meen and Dr. Jacques Rousseau, director of the Montreal Botanical Garden, figured out the approximate location of the lake from their personal knowledge of the Arctic, then flew to the general area to try to spot it.

Science News Letter, September 26, 1953

HEALTH RESEARCH LABORATORY—This new laboratory of the University of California at Los Alamos, N. M., is now completed after six years of planning and construction. It cost $1,870,000 of Atomic Energy Commission funds and will be concerned with combatting the health hazards of radioactive or toxic materials in or near atomic plants.

CHEMISTRY

Food Packed Skin-Tight With Shrinking Plastic

➤ FOOD CAN now be packed into loose-fitting plastic bags which can be shrunk to fit their contents as they are sealed, Dr. Robert D. Lowry of the Dewey and Almy Chemical Co., Cambridge, Mass., told the American Chemical Society in Chicago.

The plastic used is a special type of saran with a vinylidene chloride base. When immersed in water at about 200 degrees Fahrenheit the film shrinks 30% to form a skin-tight package.

Such dissimilar materials as glass, aluminum, paper, cellophone, vinyl and polyethylene are being used to keep moisture in food packages and to keep out oxygen that would impair food flavor. Today's pre-packaged foods demand wrappings that will not stretch, wear, puncture, tear or allow vapors to seep in or out.

Science News Letter, September 26, 1953

PUBLIC HEALTH

Diatoms in Garbage Pail Prove Egg White Fraud

➤ MICROSCOPIC FOSSILS in cheap and plentiful diatomaceous earth have helped catch a food law violator when inspector and scientist worked together.

A frozen egg processor was suspected of extracting discarded egg shells from garbage pails and adding the salvaged egg white to his product.

Paul Conger, Smithsonian Institution diatom specialist, told the American Institute of Biological Sciences meeting in Madison, Wis., that when some of the diatom material was thrown in the garbage pails, it was simple to examine the suspected frozen egg material and prove positively by microscopic examination that it contained diatoms of the same species used as a tracer by the food inspector.

Science News Letter, September 26, 1953

MEDICINE

New Drug Checks Nausea, Vomiting

➤ A NEW drug that stops nausea and vomiting with very little side effects was announced at the meeting of the American Society for Pharmacology and Experimental Therapeutics in New Haven, Conn.

The drug is called Chlorpromazine by its manufacturers, Smith, Kline and French Laboratories of Philadelphia. Chemically it is 2-chloro-10(3-dimethylaminopropyl) phenothiazine hydrochloride. Good results in tests with drug-induced vomiting and swing sickness in dogs were reported by Drs. Leonard Cook and John J. Toner of the Philadelphia firm.

Preliminary tests in patients in whom vomiting from numerous causes was a treatment problem were reported by Drs. Bartis Kent, George Morris, Stanley Rogers and Ralph Knight of Baylor University College of Medicine, Houston, Tex.

One dose of the drug gave complete relief of symptoms in 53 of 67 patients. In another 11, vomiting was stopped and nausea lessened. One had relief of vomiting without improvement of the nausea and two were not helped.

The drug can be given either by mouth or by injection into the muscles, and can be repeated.

The side effects noted were sedation in 38 cases, dizziness in 26, dryness of mouth in 15, slight rapid heart action in 16, mild blood pressure lowering in 13. The sedation and dizziness were mild in most cases. All side effects were milder when the drug was given in small doses.

Science News Letter, September 26, 1953

ASTRONOMY

Asteroid Discovered By Belgian Astronomer

➤ A HITHERTO undiscovered minor planet has been located in the heavens by a Belgian astronomer, S. Arend of the Royal Observatory at Uccle. Too faint to be seen by any but the larger telescopes, the asteroid is 12th magnitude and located in the constellation of Pisces, the Fishes. News of its discovery is being relayed to American observatories by Harvard College Observatory which is the clearing house for such observations.

Science News Letter, September 26, 1953

INVENTION

Fuel Mileage Indicator Helps Check Consumption

➤ A FUEL mileage indicator that may be the delight of economy-minded motorists and government officials has been invented by William J. Sturtz of Los Angeles.

Resembling a speedometer, the device registers the number of miles achieved to a given gallon of gasoline, the total number of gallons consumed on a certain trip, and the number of gallons used each hour.

The idea, according to Mr. Sturtz, is to provide the motorist with means of figuring out the fuel consumption either per mile or per hour, and to help him check the economy of fuel consumption at various speeds and with various gasolines.

The device is driven partly by a cable that connects into the speedometer-drive mechanism and partly by a cable that is powered by a fuel meter installed between the fuel pump and carburetor of the vehicle.

The device registers the number of miles as they are clicked off on a gallon of gasoline. Just before the gallon is expended, a bell sounds to attract the motorist's attention. Then the miles-per-gallon indicator resets to zero and begins recording the miles obtained on the next gallon of gas. Mr. Sturtz's invention is protected by patent No. 2,649,709.

Science News Letter, September 26, 1953

IN SCIEN

DENTISTRY

Tiny Amebae in Mouth Exist on Bacteria

➤ NO MATTER how hard you brush your teeth, your mouth contains tiny harmless amebae that are dependent upon certain bacteria for their existence.

Dr. Gordon Ball and John Clayton Jr. of the University of California at Los Angeles reported to the American Society of Protozoologists meeting in Madison, Wis., that the organism, known as *Endamoeba gingivalis,* is found about the gums and in the tartar of the teeth. It appears to be dependent upon bacteria to help it digest and utilize its food. It was found that even in an adequate nutritional medium the amebae died in the absence of bacteria.

The reason for this has not been clearly demonstrated. It is thought that the amebae require certain enzymes from the bacteria, without which they are unable to digest or utilize food.

These amebae are apparently harmless but are similar in this respect to other such organisms which do invade tissue and cause infection in the intestine. In the case of bleeding or other disorders of the gums, the endamebae may feed on red and white blood cells but apparently do not contribute to the gum disorder.

Science News Letter, September 26, 1953

CHEMISTRY

New Tough Rubber Needs No Vulcanization

➤ A NEW rubber which does not have to be vulcanized was reported to the American Chemical Society meeting in Chicago.

Combining a new type of styrone resin with a chloroprene rubber, in different proportions, gives a family of rubber products with valuable new properties. Described by Dr. R. J. McCutcheon and reporting work done by him, with Dr. H. S. Sell, at the Goodyear Tire & Rubber Co., Akron, Ohio the new rubber would be spoiled by vulcanization. It can, however, be processed on machinery designed to handle rubber of the conventional sort. Of outstanding toughness, the new material does not become brittle at low temperatures.

Only one other type of rubber which avoids the vulcanizing process is on the market. The ingredients of that material are styrene acrylonitrile resin blended with nitrile rubber. The new rubber is different chemically, and can be blended to show properties ranging from the stiffness of polystyrene to the waxy texture of polyethylene.

Science News Letter, September 26, 1953

ENE FIELDS

CHEMISTRY

Cooking Fat Odor Doomed by Antioxidants

➤ THAT UNPLEASANT cooking fat odor from restaurant kitchens will be a thing of the past when chemicals that repulse oxidation in fats and drying oils come into wider use.

Chemists have devised synthetic antioxidants that now are able to protect against rancidity in baked and fried foods, as well as the complex materials in other foods and animal feeds, H. R. Kraybill and L. R. Dugan Jr., of the American Meat Institute Foundation, Chicago, reported to the American Chemical Society meeting in Chicago.

The synthetic antioxidants are of what are called the "hindered phenolic type."

Packaging materials for fats and fatty foods are also being made with antioxidants, while the chemicals may be important in delaying rancidity in cured meats and foods sterilized by high energy radiations.

Natural antioxidants have been obtained from the fruit of the osage orange, but the synthetic ones have the property of retaining their protective properties through the cooling process.

Science News Letter, September 26, 1953

BIOLOGY

New Test Evaluates Fungicide Value

➤ SAID TO be the first reliable test of the effectiveness of drugs in killing fungus infections, a new, accurate technique has been developed by University of California at Los Angeles scientists in research at the Los Angeles Veterans Administration Center.

This was reported at the annual meeting of the Mycological Society of America and the American Institute of Biological Sciences in Madison, Wis.

Dr. J. E. Tarbet and Dr. T. H. Sternberg of the U.C.L.A. Medical School developed the new technique.

The technique not only indicates the fungicidal powers of the drugs but also suggests dosage levels necessary to combat the infection.

The drug to be evaluated is injected into the mice in various dosages. Then blood serum from the mice is seeded in test tubes with the infecting fungus. The rate of growth of the fungus in various serum cultures indicates the effectiveness and adequate dosage levels of the drug.

Many antibiotics and other drugs have been effective in killing fungi in the test tube but have proved ineffective in living animals. The new technique is in effect a "living animal" test.

The need for effective fungicides has been accentuated in recent years. Not only are they needed in combating such diseases as coccidioidomycosis, histoplasmosis and actinomycosis, they are also in demand for treatment of fungus complications that sometimes follow antibacterial therapy.

Science News Letter, September 26, 1953

NUTRITION

Algae to Give Oxygen For Human Use in Space

➤ ALGAE, LIKE the green scum on ponds, will provide oxygen for space explorers living at high altitudes above the earth if studies now underway at the University of Texas prove practical.

This was forecast by a report to the American Institute of Biological Sciences in Madison, Wis., by Dr. Jack E. Myers and Dr. J. Neal Phillips Jr., who have found ways to increase the growth of algae in sunlight. These little aquatic plants use light energy more efficiently to store energy in mass growth and oxygen production if exposed to alternate periods of light and dark. The Texas scientists stir the growing mass of algae culture and high turbulence gives the desired light fluctuations. Overcrowding of the algae is prevented by automatic methods of diluting the culture as the many billions of cells become too crowded.

Progress achieved has caused the Department of Space Medicine of the U. S. Air Force School of Aviation Medicine to support research for future use.

Science News Letter, September 26, 1953

MEDICINE

TB Remedy Promising In Fungous Disease

➤ "ENCOURAGING" RESULTS with the new TB medicine, isoniazid, in treatment of a highly fatal fungous infection, actinomycosis, are reported by Drs. Leon V. McVay Jr. and Douglas H. Sprunt of the University of Tennessee College of Medicine and John Gaston Hospital, Memphis, in the *Journal of the American Medical Association* (Sept. 12).

This disease attacks cattle as well as humans, and is better known under the names "lumpy jaw" and "wooden tongue."

The Memphis doctors tried the TB medicine, isoniazid, because in many ways actinomycosis is similar to tuberculosis. Larger doses, however, are needed in the treatment of the fungous infection.

Their good results came in three patients who had the fungous infection in the jaw, neck and face. Prolonged observation of a large number of cases will be needed, they point out, to determine the full value of isoniazid treatment of actinomycosis.

Science News Letter, September 26, 1953

CHEMISTRY

Blood Plasma Extender Made by Germs in Soil

➤ SUPPLEMENTING DEXTRAN as a blood fluid addition, known as a plasma extender, chemists see the possibility of using similar material, and have set up a series of tests which such material must pass to be considered a possibility for this life-saving work.

Drs. Chester E. Holmlund, Saul A. Schepartz and James J. Vavra of the University of Wisconsin reported before the American Chemical Society in Chicago their success in finding in the soil substances similar to dextran but of slightly different chemical configuration, which they call levans. These materials are formed by bacterial action in the soil. Of the variety of such substances isolated by the research team, assisted by Dr. Marvin J. Johnson, one compound referred to as levan No. 248 seemed most promising.

Injected into the veins of a rabbit, it was found to have not only no bad effects, but to persist in the blood stream many times as long as commercial dextran. Methods of extracting levan from suitable cultures and obtaining the maximum quantity were reported by the Wisconsin team.

Science News Letter, September 26, 1953

PHYSIOLOGY

How Cows Digest Shown By Artificial Stomach

➤ USING AN artificial cow's stomach, a group of scientists at Iowa State College, Ames, Iowa, feed into it a variety of cellulose products in an effort to learn how cows can digest wood.

New light on this important but little understood factor in cattle raising has been shed by this research, reported to the American Chemical Society in Chicago by Drs. Warren D. Kitts and Leland A. Underkofler.

In the cow's extra stomach, called the rumen, where cellulose digestion is carried on, cellulose is broken down by bacterial action and turned into sugar-like chemicals which furnish nourishment to the animal. In the artificial rumen which these research workers have constructed, the steps by which this breakdown is effected are followed, and the complex materials drawn off at intervals are analyzed by the process of chromatography.

The rate of breakdown is slowed down, in this artificial "stomach," by adding thymol, an antiseptic, and sodium fluoride, a poison. These chemical manipulations have allowed the research team to learn that the digestive process can break down carboxymethyl cellulose, an artificial type of cellulose simpler than wood.

The end product of cellulose digestion was found by these researches to be glucose, the sugar found in the blood stream.

Science News Letter, September 26, 1953

GENETICS

Babies for the Childless

Marriages unblessed by little ones now call upon anonymous donors. Already 10,000 children in America are products of artificial insemination.

By WATSON DAVIS

➤ ABOUT 10,000 children in America, most of them not more than 15 years old, are the products of artificial insemination, born to marriages which greatly desire children although the husband does not have the fertility to father children.

In most of these cases, no one except the married couples knows that the actual physiological father of the children is a quite anonymous donor, a young male who never meets the mother and never knows whether children are produced.

This is the application to human beings of the breeding by artificial insemination that has brought about a revolution in stock breeding in the last few decades. In the case of cattle, pigs, etc., sperm of choice male animals is shipped all over the globe. One male can have progeny by the thousands.

Human artificial insemination has not reached such proportions. In the larger cities it is available where medical skill developed over about a decade serves an urgent human need.

The childless couples who seek this route to children are made happy. They love their children in many cases even more than husbands and wives who do not need an unknown donor who furnishes his hereditary material.

Dr. Sophia J. Kleegman, clinical professor of obstetrics and gynecology at the New York University College of Medicine, reported to the recent First World Congress on Fertility and Sterility her medical experience in helping to bring about over 75 successful pregnancies by what she calls therapeutic donor insemination.

Form of Therapy

"Therapeutic insemination in human beings is a form of therapy for a certain group of infertile couples, in whom that is the only means whereby the wives could fulfill their psychobiological primary needs and destiny," Dr. Kleegman explained. "In addition, it is also therapeutic for society, since it is the only group of human beings wherein eugenics has a chance to rule."

In her infertility practice not every childless couple who wants a baby by this method is accepted as patients. She will refuse a case if she is not convinced that both husband and wife want a baby by this provide an environment in which the child will be wanted and loved. She stresses that no one should know that the child is not physically that of the husband. What is of the utmost importance is that there should be every assurance that the child will become that of the husband emotionally.

"The child is not of the husband's seed, but it must be of his heart," Dr. Kleegman feels.

The selection of the donor is completely Dr. Kleegman's responsibility. Just as interns and medical students often become blood donors for a fee, so the donors in insemination are paid a fee of $15 and it is a purely monetary transaction, except that many of them are doctors in training and are in entire sympathy with the program. Dr. Kleegman carefully matches the donor to the height, eye color and other characteristics of the husband. A rigorous inquiry into heredity of the donor is made to give the expected baby the best possible biological heritage or the best eugenic attributes. A wide variety of physical and mental characteristics is available among the donors. It is even the practice to differentiate between Christian and Jewish donors in matching them to the religious preferences of the couple.

Often it can be honestly said that no one can be sure who is the real father. If there is the least chance that the husband's own fluid might inseminate, some of his is mixed in with the donor's fluid.

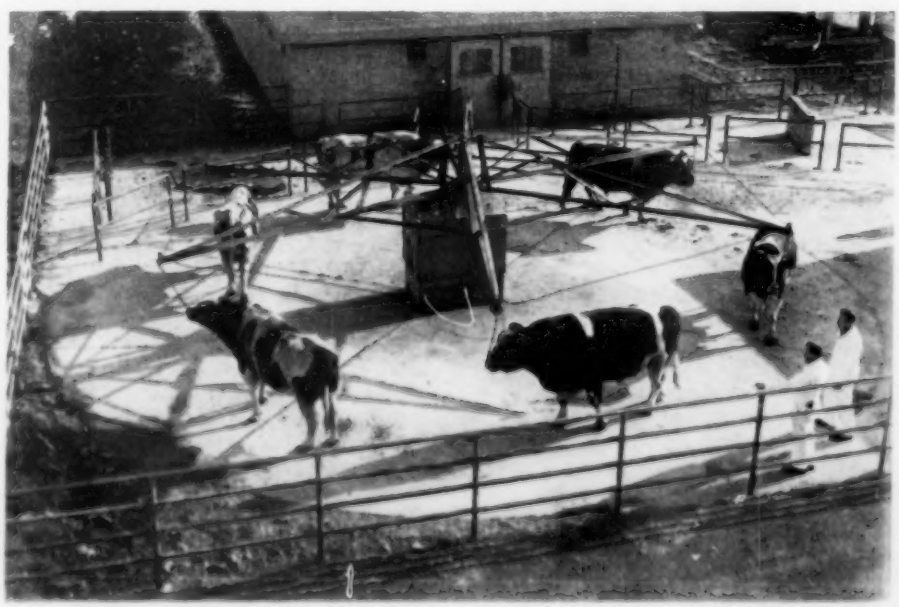
There is more sterility among human beings, both male and female, than most people realize. It runs between 10% and 15%. Interestingly enough, it is about the same in many animals, being 10% to 15% in pigs, for example.

Infertility in the man is much easier to determine than in the woman. It takes a relatively simple test to tell whether the male is sufficiently fertile to make baby production likely. A woman's fertility can often only be proven after she has actually been given the opportunity to become pregnant via regular conjugal relationships for a period of at least a year.

Of the 116 couples who have sought therapeutic insemination in Dr. Kleegman's experience, six of the men knew they were sterile before marriage and five of the couples married with the agreement to have donor babies.

The most gratifying part of this medical practice is to see the babies grow up, healthy, normal and loved in the homes that would otherwise be childless. The proof that the customers are satisfied is that they come back for more, second and even third babies by this method.

There have been no unhappy outcomes and the couples are all "ecstatically satisfied," Dr. Kleegman reports. Invariably and without exception, they have requested the same donor "because our baby is so



MULTIPLE FATHERS—These six bulls on the exerciser at the New York Artificial Breeders' Cooperative are expected to sire at least 75,000 progeny

wonderful that we want one just the same, it couldn't be better."

Both the law and the church have mixed feelings about donor babies. The matter has not been taken to the law courts very often. No sensational cases have yet arisen, and the physicians in this medical practice might be a bit hesitant to take as patients parties to a marriage that involved large fortunes.

Among the couples aided by Dr. Kleegman there has been a divorce, but the donor child had nothing to do with it. The father loved the child "more than anything else in the world," and is still devoted and attentive to the child.

Legally it might be charged that a donor baby is illegitimate and the wife has engaged in adultery. The court decisions are largely in the future, although in a case that got to a New York court a donor baby was declared legitimate.

In an English case involving artificial insemination, the child was ruled illegitimate, although in this case the semen of the husband was used and the child was not a donor baby.

In Canada, a judge, although he did not rule on the status of the child, declared that if he had it would be declared illegitimate.

No one is likely to know in the case that might cause international complications. The donor was in New York and his semen was flown within hours to Canada and produced a new young Canadian citizen. Or is the baby legally an American by paternity?

Religious opinions are not too heated, although the Catholic Church in America and the Lutheran Church in Sweeden are in opposition. So is the Church of England, but not the Episcopal Church in the United States.

The first case of human artificial insemination goes back to 1890 and the late Dr. Robert L. Dickinson was a pioneer in developing this new branch of gynecology and obstetrics. At a time when there was even greater taboo and opposition he developed the methods used, and those who are practicing therapeutic insemination in this country at the present time were taught by Dr. Dickinson.

Artificial insemination in animal and stock breeding began many years ago and is now such a vital part of the industry that stock breeders would be appalled if anyone suggested they go back to the old methods that nature uses. A prize bull can father literally thousands of progeny all over the world.

In the practice of human medicine the scientific research and experience involved in the field of animal husbandry has not been applied. Banks of the male hereditary material have not been established as yet.

Can man use for the enrichment of the human population the same methods that he uses in his breeding of animals? Will there be established banks of human semen with vital supplies of the hereditary material that might be used even years after the death of the great or unusual men who have made such contributions to posterity? This is for the future.

Science News Letter, September 26, 1953

METEOROLOGY

"Brain" Predicts Storms

► UNEXPECTED STORMY weather can be predicted before it begins, using an electronic "brain," Dr. Jule Charney of the Institute for Advanced Study, Princeton, N. J., reported to the weathermen attending the Toronto Meteorological Conference.

More accurate local storm forecasts are expected to result from this discovery, since weathermen now will be better able to select the causes leading to sudden and unexpected high winds and rains.

Using a three-level model of the atmosphere, Dr. Charney has predicted two severe storms before there was any evidence on weather maps that they might start.

After the conditions that cause the high winds and rains have become evident, local weathermen can track and forecast the storm's future path. However, spotting the conditions that lead to an unexpected storm and predicting the bad weather before it starts have previously stumped the meteorologists. Dr. Charney makes his storm forecast using a simplified model of the earth's atmosphere, charting conditions one about five miles high. Information on conditions at these three levels is fed into the Institute for Advanced Study's electronic computer, which then predicts the conditions to be found 12 or 24 hours from the starting time, doing his millions of calculations on an hour-by-hour basis.

To predict the "great storm of 1950," considered to be about the worst on record for the eastern United States, Dr. Charney sliced the atmosphere at 3,000, 10,000 and 25,000 feet. The computing machine, in about an hour's working time, then gave him an almost exact model of what actually had happened 24 hours later, he reported to the joint meeting of the American Meteorological Society and the Royal Meteorological Society in Toronto.

Dr. Charney is now working on a six-level model of the atmosphere, and with this, expects to get even more accurate predictions of the occurrence of unexpected storms.

Science News Letter, September 26, 1953

CHEMISTRY

Food Packed Skin-Tight With Shrinking Plastic

➤ FOOD CAN now be packed into loose-fitting plastic bags which can be shrunk to fit their contents as they are sealed, Dr. Robert D. Lowry of the Dewey and Almy Chemical Co., Cambridge, Mass., told the American Chemical Society in Chicago.

The plastic used is a special type of saran with a vinylidene chloride base. When immersed in water at about 200 degrees Fahrenheit the film shrinks 30% to form a skin-tight package.

Such dissimilar materials as glass, aluminum, paper, cellophane, vinyl and polyethylene are being used to keep moisture in food packages and to keep out oxygen that would impair food flavor. Today's pre-packaged foods demand wrappings that will not stretch, wear, puncture, tear or allow vapors to seep in or out.

Science News Letter, September 26, 1953

PUBLIC HEALTH

Diatoms in Garbage Pail Prove Egg White Fraud

➤ MICROSCOPIC FOSSILS in cheap and plentiful diatomaceous earth have helped catch a food law violator when inspector and scientist worked together.

A frozen egg processor was suspected of extracting discarded egg shells from garbage pails and adding the salvaged egg white to his product.

Paul Conger, Smithsonian Institution diatom specialist, told the American Institute of Biological Sciences meeting in Madison, Wis., that when some of the diatom material was thrown in the garbage pails, it was simple to examine the suspected frozen egg material and prove positively by microscopic examination that it contained diatoms of the same species used as a tracer by the food inspector.

Science News Letter, September 26, 1953

MEDICINE

New Drug Checks Nausea, Vomiting

➤ A NEW drug that stops nausea and vomiting with very little side effects was announced at the meeting of the American Society for Pharmacology and Experimental Therapeutics in New Haven, Conn.

The drug is called Chlorpromazine by its manufacturers, Smith, Kline and French Laboratories of Philadelphia. Chemically it is 2-chloro-10(3-dimethylaminopropyl) phenothiazine hydrochloride. Good results in tests with drug-induced vomiting and swing sickness in dogs were reported by Drs. Leonard Cook and John J. Toner of the Philadelphia firm.

Preliminary tests in patients in whom vomiting from numerous causes was a treatment problem were reported by Drs. Bartis Kent, George Morris, Stanley Rogers and Ralph Knight of Baylor University College of Medicine, Houston, Tex.

One dose of the drug gave complete relief of symptoms in 53 of 67 patients. In another 11, vomiting was stopped and nausea lessened. One had relief of vomiting without improvement of the nausea and two were not helped.

The drug can be given either by mouth or by injection into the muscles, and can be repeated.

The side effects noted were sedation in 38 cases, dizziness in 26, dryness of mouth in 15, slight rapid heart action in 16, mild blood pressure lowering in 13. The sedation and dizziness were mild in most cases. All side effects were milder when the drug was given in small doses.

Science News Letter, September 26, 1953

ASTRONOMY

Asteroid Discovered By Belgian Astronomer

➤ A HITHERTO undiscovered minor planet has been located in the heavens by a Belgian astronomer, S. Arend of the Royal Observatory at Uccle. Too faint to be seen by any but the larger telescopes, the asteroid is 12th magnitude and located in the constellation of Pisces, the Fishes. News of its discovery is being relayed to American observatories by Harvard College Observatory which is the clearing house for such observations.

Science News Letter, September 26, 1953

INVENTION

Fuel Mileage Indicator Helps Check Consumption

➤ A FUEL mileage indicator that may be the delight of economy-minded motorists and government officials has been invented by William J. Sturtz of Los Angeles.

Resembling a speedometer, the device registers the number of miles achieved to a given gallon of gasoline, the total number of gallons consumed on a certain trip, and the number of gallons used each hour.

The idea, according to Mr. Sturtz, is to provide the motorist with means of figuring out the fuel consumption either per mile or per hour, and to help him check the economy of fuel consumption at various speeds and with various gasolines.

The device is driven partly by a cable that connects into the speedometer-drive mechanism and partly by a cable that is powered by a fuel meter installed between the fuel pump and carburetor of the vehicle.

The device registers the number of miles as they are clicked off on a gallon of gasoline. Just before the gallon is expended, a bell sounds to attract the motorist's attention. Then the miles-per-gallon indicator resets to zero and begins recording the miles obtained on the next gallon of gas. Mr. Sturtz's invention is protected by patent No. 2,649,709.

Science News Letter, September 26, 1953

DENTISTRY

Tiny Amebae in Mouth Exist on Bacteria

➤ NO MATTER how hard you brush your teeth, your mouth contains tiny harmless amebae that are dependent upon certain bacteria for their existence.

Dr. Gordon Ball and John Clayton, Jr., of the University of California at Los Angeles reported to the American Society of Protozoologists meeting in Madison, Wis., that the organism, known as *Endamoeba gingivalis*, is found about the gums and in the tartar of the teeth. It appears to be dependent upon bacteria to help it digest and utilize its food. It was found that even in an adequate nutritional medium the amebae died in the absence of bacteria.

The reason for this has not been clearly demonstrated. It is thought that the amebae require certain enzymes from the bacteria, without which they are unable to digest or utilize food.

These amebae are apparently harmless but are similar in this respect to other such organisms which do invade tissue and cause infection in the intestine. In the case of bleeding or other disorders of the gums, the endamebae may feed on red and white blood cells but apparently do not contribute to the gum disorder.

Science News Letter, September 26, 1953

CHEMISTRY

New Tough Rubber Needs No Vulcanization

➤ A NEW rubber which does not have to be vulcanized was reported to the American Chemical Society meeting in Chicago.

Combining a new type of styrone resin with a chloroprene rubber, in different proportions, gives a family of rubber products with valuable new properties. Described by Dr. R. J. McCutcheon and reporting work done by him, with Dr. H. S. Sell, at the Goodyear Tire & Rubber Co., Akron, Ohio the new rubber would be spoiled by vulcanization. It can, however, be processed on machinery designed to handle rubber of the conventional sort. Of outstanding toughness, the new material does not become brittle at low temperatures.

Only one other type of rubber which avoids the vulcanizing process is on the market. The ingredients of that material are styrene acrylonitrile resin blended with nitrile rubber. The new rubber is different chemically, and can be blended to show properties ranging from the stiffness of polystyrene to the waxy texture of polyethylene.

Science News Letter, September 26, 1953

CHEMISTRY

Cooking Fat Odor Doomed by Antioxidants

► THAT UNPLEASANT cooking fat odor from restaurant kitchens will be a thing of the past when chemicals that retard oxidation in fats and drying oils come into wider use.

Chemists have devised synthetic antioxidants that now are able to protect against rancidity in baked and fried foods, as well as the complex materials in other foods and animal feeds, H. R. Kraybill and L. R. Dugan Jr., of the American Meat Institute Foundation, Chicago, reported to the American Chemical Society meeting in Chicago.

The synthetic antioxidants are of what are called the "hindered phenolic type."

Packaging materials for fats and fatty foods are also being made with antioxidants, while the chemicals may be important in delaying rancidity in cured meats and foods sterilized by high energy radiations.

Natural antioxidants have been obtained from the fruit of the osage orange, but the synthetic ones have the property of retaining their protective properties through the cooling process.

Science News Letter, September 26, 1953

BIOLOGY

New Test Evaluates Fungicide Value

► SAID TO be the first reliable test of the effectiveness of drugs in killing fungus infections, a new, accurate technique has been developed by University of California at Los Angeles scientists in research at the Los Angeles Veterans Administration Center.

This was reported at the annual meeting of the Mycological Society of America and the American Institute of Biological Sciences in Madison, Wis.

Dr. J. E. Tarbet and Dr. T. H. Sternberg of the U.C.L.A. Medical School developed the new technique.

The technique not only indicates the fungicidal powers of the drugs but also suggests dosage levels necessary to combat the infection.

The drug to be evaluated is injected into the mice in various dosages. Then blood serum from the mice is seeded in test tubes with the infecting fungus. The rate of growth of the fungus in various serum cultures indicates the effectiveness and adequate dosage levels of the drug.

Many antibiotics and other drugs have been effective in killing fungi in the test tube but have proved ineffective in living animals. The new technique is in effect a "living animal" test.

The need for effective fungicides has been accentuated in recent years. Not only are they needed in combating such diseases as coccidioidomycosis, histoplasmosis and actinomycosis, they are also in demand for treatment of fungus complications that sometimes follow antibacterial therapy.

Science News Letter, September 26, 1953

NUTRITION

Algae to Give Oxygen For Human Use in Space

► ALGAE, LIKE the green scum on ponds, will provide oxygen for space explorers living at high altitudes above the earth if studies now underway at the University of Texas prove practical.

This was forecast by a report to the American Institute of Biological Sciences in Madison, Wis., by Dr. Jack E. Myers and Dr. J. Neal Phillips Jr., who have found ways to increase the growth of algae in sunlight. These little aquatic plants use light energy more efficiently to store energy in mass growth and oxygen production if exposed to alternate periods of light and dark. The Texas scientists stir the growing mass of algae culture and high turbulence gives the desired light fluctuations. Overcrowding of the algae is prevented by automatic methods of diluting the culture as the many billions of cells become too crowded.

Progress achieved has caused the Department of Space Medicine of the U. S. Air Force School of Aviation Medicine to support research for future use.

Science News Letter, September 26, 1953

MEDICINE

TB Remedy Promising In Fungous Disease

► "ENCOURAGING" RESULTS with the new TB medicine, isoniazid, in treatment of a highly fatal fungous infection, actinomycosis, are reported by Drs. Leon V. McVay Jr. and Douglas H. Sprunt of the University of Tennessee College of Medicine and John Gaston Hospital, Memphis, in the *Journal of the American Medical Association* (Sept. 12).

This disease attacks cattle as well as humans, and is better known under the names "lumpy jaw" and "wooden tongue."

The Memphis doctors tried the TB medicine, isoniazid, because in many ways actinomycosis is similar to tuberculosis. Larger doses, however, are needed in the treatment of the fungous infection.

Their good results came in three patients who had the fungous infection in the jaw, neck and face. Prolonged observation of a large number of cases will be needed, they point out, to determine the full value of isoniazid treatment of actinomycosis.

Science News Letter, September 26, 1953

CHEMISTRY

Blood Plasma Extender Made by Germs in Soil

► SUPPLEMENTING DEXTRAN as a blood fluid addition, known as a plasma extender, chemists see the possibility of using similar material, and have set up a series of tests which such material must pass to be considered a possibility for this life-saving work.

Drs. Chester E. Holmlund, Saul A. Schepartz and James J. Vavra of the University of Wisconsin reported before the American Chemical Society in Chicago their success in finding in the soil substances similar to dextran but of slightly different chemical configuration, which they call levans. These materials are formed by bacterial action in the soil. Of the variety of such substances isolated by the research team, assisted by Dr. Marvin J. Johnson, one compound referred to as levan No. 248 seemed most promising.

Injected into the veins of a rabbit, it was found to have not only no bad effects, but to persist in the blood stream many times as long as commercial dextran. Methods of extracting levan from suitable cultures and obtaining the maximum quantity were reported by the Wisconsin team.

Science News Letter, September 26, 1953

PHYSIOLOGY

How Cows Digest Shown By Artificial Stomach

► USING AN artificial cow's stomach, a group of scientists at Iowa State College, Ames, Iowa, feed into it a variety of cellulose products in an effort to learn how cows can digest wood.

New light on this important but little understood factor in cattle raising has been shed by this research, reported to the American Chemical Society in Chicago by Drs. Warren D. Kitts and Leland A. Underkoffler.

In the cow's extra stomach, called the rumen, where cellulose digestion is carried on, cellulose is broken down by bacterial action and turned into sugar-like chemicals which furnish nourishment to the animal. In the artificial rumen which these research workers have constructed, the steps by which this breakdown is effected are followed, and the complex materials drawn off at intervals are analyzed by the process of chromatography.

The rate of breakdown is slowed down, in this artificial "stomach," by adding thymol, an antiseptic, and sodium fluoride, a poison. These chemical manipulations have allowed the research team to learn that the digestive process can break down carboxymethyl cellulose, an artificial type of cellulose simpler than wood.

The end product of cellulose digestion was found by these researches to be glucose, the sugar found in the blood stream.

Science News Letter, September 26, 1953

GENETICS

Babies for the Childless

Marriages unblessed by little ones now call upon anonymous donors. Already 10,000 children in America are products of artificial insemination.

By WATSON DAVIS

➤ ABOUT 10,000 children in America, most of them not more than 15 years old, are the products of artificial insemination, born to marriages which greatly desire children although the husband does not have the fertility to father children.

In most of these cases, no one except the married couples knows that the actual physiological father of the children is a quite anonymous donor, a young male who never meets the mother and never knows whether children are produced.

This is the application to human beings of the breeding by artificial insemination that has brought about a revolution in stock breeding in the last few decades. In the case of cattle, pigs, etc., sperm of choice male animals is shipped all over the globe. One male can have progeny by the thousands.

Human artificial insemination has not reached such proportions. In the larger cities it is available where medical skill developed over about a decade serves an urgent human need.

The childless couples who seek this route to children are made happy. They love their children in many cases even more than husbands and wives who do not need an unknown donor who furnishes his hereditary material.

Dr. Sophia J. Kleegman, clinical professor of obstetrics and gynecology at the New York University College of Medicine, reported to the recent First World Congress on Fertility and Sterility her medical experience in helping to bring about over 75 successful pregnancies by what she calls therapeutic donor insemination.

Form of Therapy

"Therapeutic insemination in human beings is a form of therapy for a certain group of infertile couples, in whom that is the only means whereby the wives could fulfill their psychobiological primary needs and destiny," Dr. Kleegman explained. "In addition, it is also therapeutic for society, since it is the only group of human beings wherein eugenics has a chance to rule."

In her infertility practice not every childless couple who wants a baby by this method is accepted as patients. She will refuse a case if she is not convinced that both husband and wife want a baby by this procedure and prefer it to adoption of a baby completely unrelated to either of them. She must be convinced that the family will provide an environment in which the child will be wanted and loved. She stresses that no one should know that the child is not physically that of the husband. What is of the utmost importance is that there should be every assurance that the child will become that of the husband emotionally.

"The child is not of the husband's seed, but it must be of his heart," Dr. Kleegman feels.

The selection of the donor is completely Dr. Kleegman's responsibility. Just as interns and medical students often become blood donors for a fee, so the donors in insemination are paid a fee of $15 and it is a purely monetary transaction, except that many of them are doctors in training and are in entire sympathy with the program. Dr. Kleegman carefully matches the donor to the height, eye color and other characteristics of the husband. A rigorous inquiry into heredity of the donor is made to give the expected baby the best possible biological heritage or the best eugenic attributes. A wide variety of physical and mental characteristics is available among the donors. It is even the practice to differentiate between Christian and Jewish donors in matching them to the religious preferences of the couple.

Often it can be honestly said that no one can be sure who is the real father. If there is the least chance that the husband's own fluid might inseminate, some of his is mixed in with the donor's fluid.

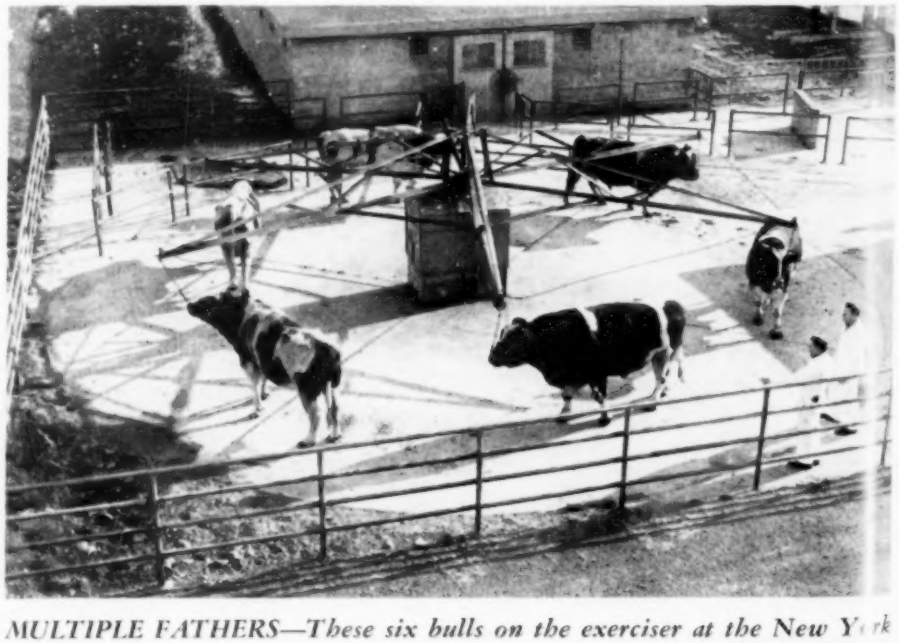
There is more sterility among human beings, both male and female, than most people realize. It runs between 10% and 15%. Interestingly enough, it is about the same in many animals, being 10% to 15% in pigs, for example.

Infertility in the man is much easier to determine than in the woman. It takes a relatively simple test to tell whether the male is sufficiently fertile to make baby production likely. A woman's fertility can often only be proven after she has actually been given the opportunity to become pregnant via regular conjugal relationships for a period of at least a year.

Of the 116 couples who have sought therapeutic insemination in Dr. Kleegman's experience, six of the men knew they were sterile before marriage and five of the couples married with the agreement to have donor babies.

The most gratifying part of this medical practice is to see the babies grow up, healthy, normal and loved in the homes that would otherwise be childless. The proof that the customers are satisfied is that they come back for more, second and even third babies by this method.

There have been no unhappy outcomes and the couples are all "ecstatically satisfied," Dr. Kleegman reports. Invariably and without exception, they have requested the same donor "because our baby is so



MULTIPLE FATHERS—These six bulls on the exerciser at the New York Artificial Breeders' Cooperative are expected to sire at least 75,000 progeny this year. Research at Cornell University Agricultural Experiment Station has made this progress possible.

onderful that we want one just the same, couldn't be better."

Both the law and the church have mixed eelings about donor babies. The matter as not been taken to the law courts very ften. No sensational cases have yet arisen, nd the physicians in this medical practice ight be a bit hesitant to take as patients arties to a marriage that involved large ortunes.

Among the couples aided by Dr. Kleegman there has been a divorce, but the donor child had nothing to do with it. The father loved the child "more than anything else in the world," and is still devoted and attentive to the child.

Legally it might be charged that a donor baby is illegitimate and the wife has engaged in adultery. The court decisions are largely in the future, although in a case that got to a New York court a donor baby was declared legitimate.

In an English case involving artificial insemination, the child was ruled illegitimate, although in this case the semen of the husband was used and the child was not a donor baby.

In Canada, a judge, although he did not rule on the status of the child, declared that if he had it would be declared illegitimate.

No one is likely to know in the case that might cause international complications. The donor was in New York and his semen was flown within hours to Canada and produced a new young Canadian citizen. Or is the baby legally an American by paternity?

Religious opinions are not too heated, although the Catholic Church in America and the Lutheran Church in Sweeden are in opposition. So is the Church of England, but not the Episcopal Church in the United States.

The first case of human artificial insemination goes back to 1890 and the late Dr. Robert L. Dickinson was a pioneer in developing this new branch of gynecology and obstetrics. At a time when there was even greater taboo and opposition he developed the methods used, and those who are practicing therapeutic insemination in this country at the present time were taught by Dr. Dickinson.

Artificial insemination in animal and stock breeding began many years ago and is now such a vital part of the industry that stock breeders would be appalled if anyone suggested they go back to the old methods that nature uses. A prize bull can father literally thousands of progeny all over the world.

In the practice of human medicine the scientific research and experience involved in the field of animal husbandry has not been applied. Banks of the male hereditary material have not been established as yet.

Can man use for the enrichment of the human population the same methods that he uses in his breeding of animals? Will there be established banks of human semen with vital supplies of the hereditary material that might be used even years after the death of the great or unusual men who have made such contributions to posterity? This is for the future.

Science News Letter, September 26, 1953

METEOROLOGY

"Brain" Predicts Storms

UNEXPECTED STORMY weather can be predicted before it begins, using an electronic "brain," Dr. Jule Charney of the Institute for Advanced Study, Princeton, N. J., reported to the weathermen attending the Toronto Meteorological Conference.

More accurate local storm forecasts are expected to result from this discovery, since weathermen now will be better able to detect the causes leading to sudden and unexpected high winds and rains.

Using a three-level model of the atmosphere, Dr. Charney has predicted two severe storms before there was any evidence on weather maps that they might start.

After the conditions that cause the high winds and rains have become evident, local weathermen can track and forecast the storm's future path. However, spotting the conditions that lead to an unexpected storm and predicting the bad weather before it starts have previously stumped the meteorologists. Dr. Charney makes his storm forecast using a simplified model of the earth's atmosphere, charting conditions across the country at three levels, one near the ground, one about two miles high and one about five miles high. Information on conditions at these three levels is fed into the Institute for Advanced Study's electronic computer, which then predicts the conditions to be found 12 or 24 hours from the starting time, doing his millions of calculations on an hour-by-hour basis.

To predict the "great storm of 1950," considered to be about the worst on record for the eastern United States, Dr. Charney sliced the atmosphere at 3,000, 10,000 and 25,000 feet. The computing machine, in about an hour's working time, then gave him an almost exact model of what actually had happened 24 hours later, he reported to the joint meeting of the American Meteorological Society and the Royal Meteorological Society in Toronto.

Dr. Charney is now working on a six-level model of the atmosphere, and with this, expects to get even more accurate predictions of the occurrence of unexpected storms.

Science News Letter, September 26, 1953

The *tomato* is the most popular garden vegetable in this country.

Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N. W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

AIR DROP: Men, Weapons, and Cargo by Parachute—C. B. Colby—*Coward-McCann*, 48 p., illus., $1.00. Photographs show paratroopers, equipment, even cannon and lifeboats, floating down out of the sky on billowing parachutes.

ALONG THE GREAT RIVERS—Gordon Cooper—*Philosophical Library*, 159 p., illus., $4.75. The author's aim is not to present a geological treatise but to picture in words (and photographs) the life stories of some of the world's greatest rivers. Included among others are the Nile, the Zambezi, the Yangtze, the Volga, the Mississippi and the Amazon.

ANNUAL REPORT, THE ROCKEFELLER FOUNDATION 1952—Dean Rusk, president—*Rockefeller Foundation*, 465 p., illus., paper, free upon request direct to publisher, 49 West 49th St., New York. Total appropriations for the year were $16,640,355 of which $3,862,150 was devoted to natural sciences and agriculture, $4,366,835 to social sciences.

BIRDS AS INDIVIDUALS—Len Howard—*Doubleday*, 219 p., illus., $4.00. The author, an English woman who is a professional musician as well as student of birds, has made friends of birds until she has been able to observe them as individuals. A foreword by Roger Tory Peterson tells of a visit to her home, "Bird Cottage."

THE BOOK OF HEALTH: A Medical Encyclopedia for Everyone—Randolph L. Clark, Jr. and Russell W. Cumley, Eds.—*Elsevier Press*, 834 p., illus., $10.00. Written by a staff of experts under the guidance of 242 physicians and scientists, this enables the reader to understand what can be done by medical science to maintain the highest possible health standards. It is not a "home doctor book."

BOREAL HEPATICAE: A Manual of the Liverworts of Minnesota and Adjacent Regions—Rudolf M. Schuster — *Univ. of Notre Dame Press*, American Midland Naturalist Vol. 49, No. 2, 427 p., illus., paper, $4.00. Price correction.

CONVERSATION WITH THE EARTH—Hans Cloos, translated from the German by E. B. Garside, edited and slightly abridged by Ernst Cloos and Curt Dietz—*Knopf*, 413 p., illus., $5.75. A poetically written story of the life of a geologist and, interwoven with it, the story of the life of the earth.

DANGER FIGHTERS: Men and Ships of the U. S. Coast Guard—C. B. Colby—*Coward-McCann*, 48 p., illus., $1.00. The story of one of our Services in photographs and brief text.

THE FIRST BOOK OF PLANTS—Alice Dickinson—*Franklin Watts*, 93 p., illus., $1.75. A delightful book for children telling in words and pictures how plants get their nourishment and grow, how they spread their pollen and develop their seeds.

HEREDITY IN HEALTH AND MENTAL DISORDER: Principles of Psychiatric Genetics in the Light of Comparative Twin Studies—Franz J. Kallmann—*Norton*, 315 p., illus., $6.00. Study and comparison of one-egg and two-egg twins have enabled scientists to learn of the respective contributions of heredity and environment to mental health and illness.

MATHEMATICAL METHODS FOR SCIENTISTS AND ENGINEERS—Lloyd P. Smith—*Prentice-Hall*, 453 p., $10.00. Intended to provide the physics student (and others) with a knowledge of the more important mathematical functions and their properties and the facility to apply them to physics problems.

THE MATURE WOMAN: Her Richest Years—Anna Kleegman Daniels edited by Victor Rosen—*Prentice-Hall*, 237 p., $3.95. A physician gives reassurance as well as factual information to the woman who feels that she is no longer youthful.

MOTIVATION AND MORALE IN INDUSTRY—Morris S. Viteles—*Norton*, 510 p., illus., $9.50. Reporting scientific studies concerned with giving workers in industry the satisfaction going with high productivity and harmonious relations with fellow employees and management.

THE OVERLOADED ARK—Gerald M. Durrell—*Viking*, 272 p., illus., $3.75. Description of a trip to the great rain forests of the Cameroons in West Africa to collect animals, birds and reptiles for zoos. "Ninety percent of your time," the author reveals, "is spent tending your captures and the rest in tramping miles through the forest in pursuit of some creature that refuses to be caught."

A PICTORIAL HISTORY OF THE AUTOMOBILE: As Seen in Motor Magazine, 1903-1953—Philip Van Doren Stern—*Viking*, 256 p., illus., $7.5[illegible] Showing not only the strange looking mod[els] of yesteryear, but also the garb the motor[ists] wore and some of the sights they traveled to s[ee]

RECREATION FOR THE AGING—Arthur W[illiams]—*Association Press*, 192 p., $3.00. N[ot] only do we have more old people these da[ys] but they are faced with an unaccustomed weal[th] of leisure. Here are suggestions for making [it] satisfying.

A SIMPLE GUIDE TO MODERN VALENCY THEORY—G. I. Brown—*Longmans, Green*, 1[76] p., illus., $2.50. Intended to bridge the g[ap] between the elementary treatment of valency [in] standard textbooks and that in the more ad[-] vanced works on valency. For advanced st[u]dents and chemists who want to bring them[-] selves up to date on modern developments.

STAR OF WONDER — Robert R. Coles and Frances Frost—*McGraw-Hill*, 48 p., illus., $2.[75] A child's story of how a small brother and sister learned on Christmas eve at the planetarium the scientific explanation of what the three kings may have seen in the east.

TIGER: The Story of a Swallowtail Butterfly —Robert M. McClung—*Morrow*, 46 p., illus., $2.00. The story, told for young children, of a butterfly and his neighbors in the clover field.

20 YEARS OF PSYCHOANALYSIS: A Symposium in Celebration of the Twentieth Anniversary of the Chicago Institute for Psychoanalysis—Franz Alexander and Helen Ross, Eds.—*Norton*, [3]09 p., $3.75. Includes papers dealing with the influence of the basic concepts of psychoanalysis on medicine and medical teaching.

YOUR TRIP INTO SPACE—Lynn Poole—*McGraw-Hill*, 224 p., illus., $2.75. The author, producer of a Johns Hopkins University science television program, predicts that the first flight to the moon will occur within the next 50 years. He tells you about some of the dangers and the preparations you should make for the trip.

Science News Letter, September 26, 1953

One pint of blood yields just about the amount of *gamma globulin* needed for one polio-prevention shot.

At no cost whatever

you can join the

largest scientific organization in the world:

SCIENCE CLUBS OF AMERICA

This is the way you can join. Each member belongs to a club. Each club has a sponsor—a science teacher, parent, youth leader or professional scientist. The sponsor affiliates the club (see the coupon below) and receives all the free materials from SCA to keep the club informed and functioning.

Clubs can be small or large; size ranges from 3 to 700 members; average is about 25. Your club can be for boys and girls of any age, in or out of school.

Sponsors and members plan their programs together to suit the age and science interests of the group. SCA gives you many suggestions on what to do and how to do it.

TWO NATIONAL EVENTS are held each year especially for members of SCA. Your club can take part in both of them now or when your members are old enough.

The Annual National Science Fair is held each spring in a different city: 1950—Philadelphia; 1951—St. Louis; 1952—Washington; 1953—Oak Ridge, Tenn.; 1954—Purdue University, Lafayette, Ind. The boys and girls who show the best science exhibits in cooperating local science fairs get three-day all-expenses-paid trips to the National Science Fair and a chance to compete there for honors and awards. Only sophomores, juniors and seniors in high school are eligible to go to the NSF but in most local science fairs boys and girls of all ages can compete for local honors.

The Annual National Science Talent Search is held each year for seniors in high school who want to compete for $11,000 in Westinghouse Science Scholarships for their college education. Annually 300 are honored. Of these, 40 boys and girls, chosen as winners, also receive a five-day all-expenses-paid trip to Washington, D. C. to attend the Science Talent Institute; the 13th will be held in 1954. Experience in science clubs and participation in science fairs is great practice for those who are planning to compete in the STS when they are old enough.

15,000 Affiliated Clubs

. . . one third of a million boys and girls affiliated with Science Clubs of America in the United States and abroad.

FREE to Club Sponsors

($1 to all others, and for extra copies)

TABLE OF CONTENTS

Adults, who want to sponsor a club, please sign below:

Boys and girls, who want to affiliate a club with SCA, get your sponsor to sign below:

If you do not have a club, and do not plan to form one, you may have a copy of the Handbook by sending your check or money order for $1.00.

SCIENCE CLUBS OF AMERICA
1719 N St., N.W. • Washington 6, D. C.

I want to affiliate our science club with SCA. Please send me the free SPONSOR HANDBOOK.

Sponsor _____

Position _____

School _____

School Address _____

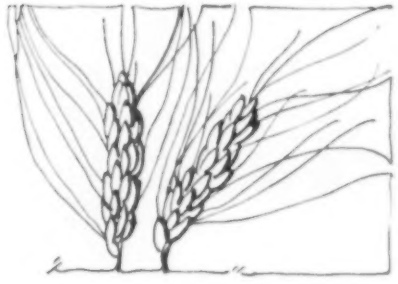
City _____ Zone _____ State _____

If you are not a sponsor, enclose $1.00 for copy and check here ( )

9-26-3

BIOCHEMISTRY

NATURE RAMBLINGS



Pinned With Magnesium

► A RECIPE for making life possible on an uninhabited planet might very well begin, "Use 55 parts carbon, 72 parts hydrogen, five parts oxygen, four parts nitrogen, and one part magnesium."

The "parts" are atoms, and the life-enabling recipe is the formula for chlorophyll a, one of the two green, sunlight-capturing, food-making pigments in all green plants. Its opposite number, chlorophyll b, differs by two atoms of hydrogen and one of oxygen, but winds up with the same single atom of magnesium.

Although the numbers of atoms of constituent elements in a molecule of chlorophyll are known, biochemists are not yet sure exactly how they are put together. Some tentative diagrams of its structure have been drawn up, and in practically all of them, the "Mg" that symbolizes magnesium is shown at the center, as if it were the kingpin of an intricate mechanism.

So it is in a sense; although we do not know what its exact function is in the activity of chlorophyll, it is certain that if that one magnesium atom were withdrawn, the remainder of the complex could no longer be called a chlorophyll molecule.

Chlorophyll, using sun-power to weld water and carbon dioxide together to form sugar, seems to act as a catalyst. That is, its own substance is neither increased nor diminished, even momentarily, by the process which it promotes, although the greater part of its bulk is made up of carbon, hydrogen and oxygen atoms—the identical elements that are bound together in the foodstuff formed by its action.

There is not even complete agreement about what that first-formed foodstuff is. It is usually said to be some form of sugar, but there are also plant physiologists who believe that starch is made first, then changed into sugar for transportation to other parts of the plant in solution. Sugars and starches are always found in such intimate association with active chlorophyll that it is extremely difficult to tell which came first.

Of this much, however, we may be certain: that without chlorophyll there would be no trees, no grainfields, no pastures, not even any mosses or green pond-scums. And every molecule of chlorophyll seems to be held together by a single pin of magnesium.

Science News Letter, September 26, 1953

NUTRITION

Antibiotics for Animals

Betters their general health, puts more meat on them, and increases production. Greatest improvement for those in poor condition.

► ANTIBIOTICS ARE useful outside their role as "miracle drugs."

Antibiotics can improve nutrition, cause hens to lay more eggs, put more meat on swine and calves, and better the general health of farm animals. Good effects of feeding antibiotics regularly to animals being raised for the market were reported to the American Chemical Society by representatives of state experiment stations, university research departments, pharmaceutical companies, and manufacturers of animal feeds.

The results of experimental feeding, however, show that greater improvement is found among animals which started out with inadequate diets and in poor condition.

Cows and other ruminant animals can have their digestion interfered with if antibiotics are given with their feed, because their ability to digest woody stalks depends on bacteria in the extra stomach, the rumen, with which these cud-chewing animals are provided. Dr. Louis L. Rusoff of Louisiana University, who has studied the effect of administering aureomycin to calves, finds better results from injecting the antibiotic into the muscles than from allowing it to pass through the digestive system. Better growth of calves with this treatment leads him to believe that the antibiotic stimulates growth of bone.

Addition of certain compounds containing arsenic, similar to some that have been used in medicine for human beings, to control disease in animals, was reported to the meeting by Dr. D. V. Frost and Dr. H. C. Spruth of Abbott Laboratories. Arsenicals seem to supplement the antibiotics in improving the health of animals, in the experience of this research team.

Plants, too, are improved by having their diseases curbed by use of antibiotics. Results of research in this field were also reported.

Extension of the application of antibiotics to food preservation was reported to the meeting by packers of everything from fish to spinach. Although certain specific benefits were reported, the general feeling was voiced by Dr. F. E. Deatherage of the Ohio State Agricultural Experiment Station, who said, "Antibiotics may have a place in the meat industry, but much work must be done to determine their proper place."

Science News Letter, September 26, 1953

PSYCHIATRY

"Pygmalion Effect" Noted in Patients

► PATIENTS WHO undergo psychiatric treatment tend to assume the personality traits of the psychiatrist, a condition known as the "Pygmalion effect," Dr. Joseph G. Sheehan, Univeristy of California at Los Angeles psychologist, reports.

Pygmalion was a legendary king of Cyprus who made an ivory statue of a maiden and fell in love with it. Aphrodite thereupon endowed it with life.

The modern "Pygmalion effect" was observed in Rorschach ink blot tests given to patients at the U.C.L.A. Student Health Service and at the Psychological Clinic. Seventeen of 21 subjects revealed definite shifts in personality in the direction of the psychiatrist or psychologist treating them.

Patients seemed to acquire some of the liabilities of therapists along with their assets. Outgoing extrovert therapists seemed to bring out extroversive qualities in their patients, while patients of the opposite-type therapists seemed to become more introversive and retiring.

The extent of shift appeared primarily a function of the therapist's personality and was relatively independent of therapeutic techniques.

Patients rated by their therapists as responding best to treatment showed more personality resemblance to their therapists. This could be interpreted to mean either that the psychiatrists or psychologists had healthier personalities, or that they judged personality shifts in their direction as indicative of better judgment.

Science News Letter, September 26, 1953

NUTRITION

Snails Useful Feed

▶ THE GIANT African snail, a major agricultural pest in warm parts of the world, could become useful.

Two investigations, one near completion and the other just starting, are under way to determine how to get rid of the giant snail, *Achatina fulica.*

Recently, University of Arizona zoologists, Drs. Albert Mead and Arthur Kemmerer, began a study of the protein value of the giant snail, with the idea of using it as an enricher of livestock food when dehydrated and reduced to a powder.

A single one of these giant snails was found to contain about two times as much of two essential amino acids as there is in a whole hen's egg, the scientists said. Since standard vegetable-derived animal feeds, such as cottonseed meal, are limited in protein content, Drs. Mead and Kemmerer believe the addition of snail meal might make a superior animal feed.

Dr. Yoshio Kondo of the Bishop Museum in Honolulu has been observing the effects on the African-snail population of the introduction of cannibal snails (Gonaxis) to Agiguan, one of a chain of highly snail-infested islands in the South Pacific. Dr. Kondo found that although 300 Gonaxis snails introduced in 1950 have multiplied to 25,000, they exert small control thus far over the giant snail numbers. Rats and crabs do a much better job of eating the giant snails, Dr. Kondo observed.

The Achatina snails came originally to certain of the Pacific islands from Africa. During World War II, the Japanese imported the snails to other isolated Pacific islands to feed their soldiers.

Science News Letter, September 26, 1953

CHEMISTRY

Antibiotics Better Whisky

▶ ANTIBIOTICS, IN addition to their remarkable curative properties for man and beast, are even capable of improving whisky.

The improvement comes in suppressing in the fermenting mash those side reactions produced by germs of the kind that sour milk. These germs reduce the amount of alcohol produced, and may affect the taste of the whisky. Antibiotics will kill off these lactic acid-forming germs, but the manufacturer must be sure that they do not at the same time kill the yeast organisms which are necessary to make the whisky.

A number of antibiotic preparations were tried out, in researches reported to the American Chemical Society in Chicago by Dr. W. H. Day, on behalf of a group in the research department of Hiram Walker & Sons, including Dr. W. C. Serjak, now with Hughes Aircraft Co., and Drs. J. R. Stratton and L. Stone of Peoria, Ill. The antibiotics which were successful in limiting the growth of lactic acid bacteria without stopping yeast growth were tyrothricin, terramycin, aureomycin, chloromycetin and penicillin.

Beer also may have its troubles relieved by the new wonder drugs. Dr. Fred B. Strandskov of the F. & M. Schaefer Brewing Co., told the chemists that three types of bacteria that grow in finished beer create a problem for the brewer.

Colonies of them are known as "secondary yeast," although actually they are more like the germs that make milk sour. Several kinds of antibiotics, including one called thiolutin, are effective in stopping this contamination in beer.

Science News Letter, September 26, 1953

CHEMISTRY

Chemical Fed to Cows Keeps Milk Sweet Longer

▶ MILK CAN be kept sweet by treating the cow with a bacteriostatic chemical.

Drs. G. G. Kelley and Karl Dittmer of Florida State University told the meeting of the American Chemical Society in Chicago that the chemical menadione, a methyl derivative of naphthoquinone, will preserve unpasteurized milk when added in small amount. But when 25 milligrams of the chemical per day is fed to the cows, the milk those cows give is also protected from souring for a period of time 20% longer than the milk from untreated cows.

Menadione is a precursor of vitamin K.

Science News Letter, September 26, 1953

QUESTIONS

AERONAUTICS — How does freon gas contribute to high altitude flying? p. 198.

• • •

MEDICINE—What remedies help patients with ruptured appendix? p. 199.

• • •

METEOROLOGY—What new techniques are expected to improve weather forecasting? p. 196.

• • •

PHARMACY—What are the advantages of penicillin O? p. 198.

• • •

RADIO—Where has a "Dick Tracy" wrist radio been made? p. 196.

• • •

SURGERY—What proportion of ulcer patients suffer from severe bleeding? p. 195.

Why is it dangerous to imbed plastic inside the body? p. 197.

• • •

ZOOLOGY—Why are camels being studied? p. 198.

• • •

Photographs: Cover, U. S. Army; p. 195, U. S. Air Force; p. 197, University of Wisconsin; p. 199, University of California; p. 202, Cornell University; p. 208, Bakelite Co.

New Machines and Gadgets

For sources of more information on new things described, send a self-addressed stamped envelope to SCIENCE NEWS LETTER, 1719 N St., N.W., Washington 6, D. C., and ask for Gadget Bulletin 693. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

❁ *MARGIN STENCIL, made of celluloid-like material, slips over typing paper and provides automatic text framing for letters and reports to be typed. Available in small, large and legal sizes, it is designed to save time for students and stenographers. A line counter is printed on the durable device.*

Science News Letter, September 26, 1953

❁ *GRIPPING MAT helps the housewife unscrew tightly sealed fruit jars, and also doubles as a rubber coaster that keeps glasses and dishes from slipping on slick tabletops. Hundreds of small suction cups on each side endow the palm-sized circular mat with its vise-like gripping qualities.*

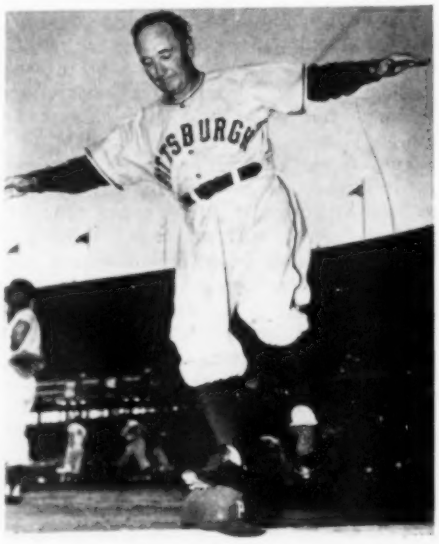
Science News Letter, September 26, 1953

❁ *VIBRATION DETECTOR locates and measures dangerous vibrations of engine shafts and bearings, transmissions, stationary or mobile machines and equipment. Weighing less than four pounds, this small instrument records its vibration findings on a waxed paper chart.*

Science News Letter, September 26, 1953

❁ *PLASTIC PANELS take the place of conventional shower curtains and fit standard shower and tub enclosures. Made of plastic in five pastel colors, the panel doors slide along metal guides and give water-tight privacy to the bather.*

Science News Letter, September 26, 1953



❁ *BASEBALL CAP made of tough polyester resins designed to protect sandlot and professional players from bean balls is shown in the photograph. Shielding the wearer's temples and areas over the ears, the cap resists the violent impact of fast-pitched, batted or thrown balls. A sweatband and sponge dome liner help absorb the shock.*

Science News Letter, September 26, 1953

❁ *PAGING SERVICE now is being installed in many large cities to help bosses get messages to their off-duty or errand-running employees. Subscribers to the service are outfitted with tiny portable radio receivers to which they listen for a few seconds each hour. Messages can be broadcast to the receivers as far as 35 miles away.*

Science News Letter, September 26, 1953

❁ *BATTERY-POWERED SHAVER is said to yield "weeks of shaves" from its three-flashlight-cell power plant. The shaver has 12 self-sharpening rotary cutters which spin inside its two cutting heads. The shaver comes in a kit that includes an unbreakable mirror and a pigskin travel case.*

Science News Letter, September 26, 1953

❁ *TELEPHONE STAND, made of black wrought iron, also holds a telephone book, note pad and pencil within easy reach of the telephone user. Lightweight and portable, the stand's legs are rubber-tipped to prevent marring hardwood floors.*

Science News Letter, September 26, 1953

Do You Know?

In the three years 1950-52, 68 explosions caused 186 fatalities in American *coal mines.*

Candies containing dairy butter will keep three times longer if 3% yeast or oat flour is included in the recipe.

A novel *fan*, shaped like a malted-milk container, delivers 300,000 cubic feet of fresh air a minute into underground mines.

The taste and appearance of *vegetables* high in vitamin C are closely related to the amount of this vitamin that survives the cooking process.

Deposits of *lithium* ore in Kings Mountain, North Carolina, are the largest known in North America.

A house with no *insulation* requires more than 1½ times as much fuel as a well-insulated home of the same construction.

The *guava*, a tropical fruit grown in Florida, contains a large amount of vitamin C.

Better wear and greater resistance to frost is promised *asphalt* roads by a new synthetic-rubber reinforcing compound.

The oil-filter on the carrier "U.S.S. Wasp" can *filter* fuel free of contaminants at the rate of 1,200 gallons a minute.